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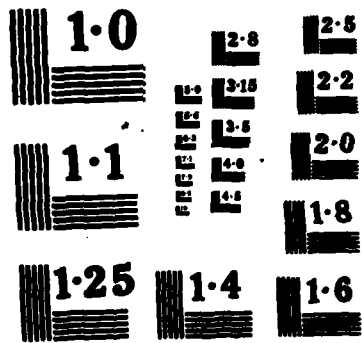
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# **Economic Cost and Benefits of Subsidizing Western Credits to the East**

**Daniel F. Kohler**

**With Stephen W. Salant, Donald P. Henry,  
Keith W. Crane, Mark M. Hopkins**

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**July 1984**

**Prepared for the  
Office of the Under Secretary of Defense  
for Policy**



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## **PREFACE**

This report summarizes the main findings of research conducted for the Office of the Under Secretary of Defense for Policy. It is part of Rand's research program on international economic policy and should be of interest to policymakers concerned with international resource flows. It provides estimates of resource flows to the Soviet Bloc resulting from Western trade policies, and analyzes the effects of these policies on the economies of the Organization for Economic Cooperation and Development and of the Soviet Bloc.

Other Rand Publications within the same project include:

- Daniel F. Kohler and Kip T. Fisher, "Subsidization of East-West Trade Through Credit Insurance and Loan Guarantees," N-1951-USDP, January 1983.
- Daniel F. Kohler, "Incentives and Insurance in International Financial Markets," N-2117-USDP, June 1984.
- Stephen W. Salant, "Export Subsidies as Instruments of Economic and Foreign Policy," N-2120-USDP, June 1984.
- Keith Crane and Daniel F. Kohler, "The Effect of Export Credit Subsidies on Western Exports to the Soviet Bloc," N-2106-USDP, June 1984.

These documents should also inform the current debate on international export competition and the problem of excessive debt burdens by some borrowing countries (or excessive lending by Western governments and banks).

## SUMMARY

Western governments subsidize credits extended to foreign purchasers of their export products directly by extending loans at rates below their own cost of funds, or indirectly by guaranteeing repayment to the lender. We estimate the value of these subsidies as they pertain to loans to the Communist world and analyze the effects they have on economic welfare in the exporting and importing countries.

In 1981 the total volume of officially supported loans from OECD countries to the communist countries was approximately \$14 billion. For that year we estimate the total value of direct and indirect subsidies to have been between \$2.7 and \$3.3 billion, or slightly more than 20 percent of the total value of loans granted. About two thirds of this amount is in the form of indirect subsidies.

Direct and indirect subsidies both bestow the same benefits on the borrower: lower financing costs. Without guarantees from Western governments, communist countries would have to pay interest rates considerably above the risk free interest rates in the Western countries.<sup>1</sup> Western lenders are concerned about the probability of being repaid on their loans to the East, and their concern is reflected in a risk surcharge added to the financing costs. This surcharge is removed when a Western government extends a repayment guarantee on behalf of a foreign borrower; because with a guarantee, the lender will be repaid whether the borrower defaults or not, and he thus has no reason for demanding a risk surcharge.

Although the guarantee's value to the borrower is obvious, its cost to the lending country is not always well understood. Clearly, if the foreign borrower defaults, the costs to the government are equal to the amount of the guarantee. Without government guarantees, foreign borrowers would bear these costs through higher risk surcharges. But even if the foreign borrowers repay their loans, there are costs associated with official government guarantees. Thanks to the repayment guarantee, foreign borrowers obtain preferential access to Western financial markets. They pay less than the social opportunity costs for the funds they borrow.

The direct and indirect export credit subsidies, especially on loans to communist countries, are not extended to benefit foreign borrowers, of

<sup>1</sup>It is possible that even Western governments are not considered to be completely risk free borrowers. However, we consider the likelihood of the U.S., German, and other major Western governments defaulting on their loans small enough to be ignored.

course. These programs are in place because Western governments believe that they increase employment and welfare in the exporting countries. The benefits to foreign purchasers of Western export goods are unintended side effects.

Salant (1984) has analyzed the circumstances in which export subsidies are likely to increase welfare in the exporting (and subsidizing) country. His main findings are summarized here. Subsidies are more likely to *reduce* welfare in the exporting country than to increase it. There are special circumstances in which export subsidies might be advantageous; however, they are rather rare and do not rationalize the current widespread use of such export promotion tools. Quite the contrary result applies to Western trade with the Soviet Bloc. Given the special circumstances of this trade, export taxes, not subsidies, would probably be the optimal policy.

For the communist countries, Western export subsidies are unambiguously beneficial. We estimate that they enable the Soviet Union to maintain a higher level of military expenditure growth without having to reduce civilian expenditure growth or vice versa. The actual size of these benefits is not very large relative to the overall size of the Soviet economy; but if similar calculations were made for other communist countries, where the subsidies are larger relative to the military budgets and the overall size of the economy, we would probably find considerably larger benefits.

It follows that the only clearcut winners under the current system are the Communist countries. The Western export industries are also beneficiaries, but their gains are more than offset by the losses of Western consumers and taxpayers. The realization that we are helping the communists without really helping ourselves gives added weight to the case for a reorientation of current Western export subsidy policies.

We have analyzed the likely reductions in Western exports that a denial of export credit subsidies to the Soviet Union and Eastern Europe in 1981 would have caused. We find that OECD exports to the Soviet Union and Eastern Europe would have been reduced by less than 5 percent overall, and that both Europe and the United States would have been about equally affected. This estimate of generally small effects stands in sharp contrast to the usually much gloomier predictions of the interested export industries. A reduction in export sales is actually a benefit to Western economies because it is they who pay for the subsidies through higher prices and interest rates.



## **ACKNOWLEDGMENTS**

We would like to thank the many individuals who have provided information, inspiration, and advice to this project. We would especially like to thank our Rand colleagues, Charles Wolf, Jr., Michael Kennedy, and Anthony Pascal, who reviewed the manuscript, and Helen Turin, whose editing made it readable. Of course, we retain sole responsibility for any remaining errors.

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## I. INTRODUCTION

Each member country of the Organization for Economic Cooperation and Development (OECD) has programs intended to give its export industries a competitive advantage in the world markets. These activities range from publicity and advertising all the way to direct transfer payments. Most widespread is the provision of finance at less than market rates and the extension of repayment guarantees by the government.

Sometimes the government entrusts a private or semi-private organization with the day-to-day administration of the export financing and guarantee programs. The legal organization of export credit and guarantee agencies runs the gamut from private companies acting on behalf of the government, to regular government departments of almost ministerial status. Examples are the export-import bank (EXIM Bank) of the United States, which finances itself through borrowing backed by the full faith and credit of the U.S. government, but which is otherwise independent of the administration; Hermes Kreditversicherungs AG in West Germany, a private insurance company acting as agent for the German government; the export credits guarantee department (ECGD) in Great Britain, which is part of the British government; and the commodity credit corporation (CCC) in the United States, which is a part of the U.S. Department of Agriculture. EXIM Bank provides insurance and guarantees in addition to its direct loan program.

Exports to the Eastern Bloc are usually not exempted from such programs. As a result they benefit from the same kind of support that exports to other parts of the world enjoy. In this report we estimate the extent of these subsidies, and analyze their costs and benefits to the exporting and importing countries.

### TERMINOLOGY

We confine our attention to export subsidies that are applied to the financing of the exports. Direct subsidies involve a direct transfer of funds by the government to either the lender or borrower, and indirect subsidies do not. More specifically, direct subsidies are extended when the government either subsidizes the interest rate a borrower has to pay to a private lender, or when the government itself loans directly at rates below its own marginal cost of funds. Indirect subsidies are the

result of the government assuming the risks of lending to foreign borrowers. These subsidies do not involve an overt transfer of funds from the government, but they nevertheless represent economic costs to the lending country.

By guaranteeing the loans extended to foreign borrowers, the government assures that these borrowers enjoy preferential access to domestic financial markets. As a result they pay lower interest rates. In the absence of government guarantees, domestic lenders would assume the foreign credit risks, albeit at a price. They would charge the foreign borrower a higher interest rate, commensurate with how they perceive his creditworthiness. If the government assumes the risks without compensation, or at a price that is below what private investors would demand, it deprives private investors of a business opportunity. The economic costs of government guarantee programs are the forgone income of domestic risktakers.<sup>1</sup>

We shall use the term "risk surcharge" to describe the addition to the risk free interest rate demanded by a risk neutral investor to compensate him for the risks. This concept is very close to what in financial circles is sometimes referred to as the "spread." It differs from what is commonly called the "risk premium"—the payment needed over and above the actuarially fair return to induce a risk averse individual to take a gamble. In the actual calculations we always assume lenders to be risk neutral. Appendix A briefly discusses what modifications would be needed to allow for risk aversion by lenders. All the key results, however, remain unaffected by this assumption.

International credit risks are usually subdivided into political and commercial risks. Commercial risks are the private risks of default due to bankruptcy by a private borrower (delkredere risks). Political risks subsume all other default risks such as those due to national bankruptcy, war, insurrection, nonconvertibility of foreign currency. Some official credit risk insurers even include risks due to natural disasters in this category. This report deals solely with export credit guarantees on loans to centrally planned economies (CPE), so we confine our attention to political, or more precisely noncommercial, risks.

## ORGANIZATION OF THIS REPORT

In Sec. II we estimate the direct and indirect subsidies on officially supported export credits to the Soviet Union, its allies, and the other

<sup>1</sup>Contrary to what many might believe, there is an established market for international nonpayment risks. About one third of insured U.S. export credits are insured by private companies, not by the EXIM Bank or the CCC (see Kohler and Fisher, 1983).

communist countries. We find that the direct subsidies may amount to as much as \$1.3 billion, almost 10 percent of the total volume of \$14 billion in officially supported new loans granted by the OECD governments to the communist world in 1981, the latest year for which data were available.<sup>2</sup> The indirect subsidies may amount to another \$1.4 to \$2 billion, depending on how risky the private market perceived loans to communist countries to have been in 1981. In sum, the total subsidy granted by OECD governments on loans to the communist world in 1981 was somewhere between \$2.7 and \$3.3 billion, roughly 20 percent of the total value of new loans granted.

In Sec. III we consider the economic arguments that have been advanced to justify export subsidies on the grounds that they improve the welfare of the exporting country, or reduce the harm done by competing subsidies from other exporters. We find most of these arguments to be not convincing or plainly fallacious. There are a few exceptional sets of circumstances in which specifically targeted export subsidies might improve the exporting country's welfare. However, when we examine the current export subsidization programs we find no evidence that such special cases are applicable or even relevant. Especially on trade with the Eastern Bloc, it is most doubtful that any one of these special cases applies.

Although the benefit of export subsidies to the exporting country is doubtful at best, it is unambiguous for the importer. The direct and indirect subsidies on officially supported credits by OECD countries to the Soviet Union, Eastern Europe, and other communist countries transfer resources that make the importing countries better off. We obtain an upper bound of the benefits they enjoy by assuming that the full value of the subsidy is transferred to the importer. Subsidies granted in 1981 enabled the Soviet Union and Eastern Europe to import about 4.5 percent more from the OECD areas than they otherwise would have. Alternatively, removing the subsidies would have reduced OECD exports to the Soviet Union and Eastern Europe by about 4.5 percent. As far as the Soviet Union is concerned, we conclude that with a continuation of the current subsidy policies, compared with a policy of no more subsidies after 1981, the growth rate of defense output over the next decade could be increased by .22 percent per year without any reduction in the growth rate of nonmilitary output. These estimates are discussed in Sec. IV.

The assumption that all of the subsidy is transferred to the importer might be slightly too extreme. Nevertheless, it is probably more accu-

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<sup>2</sup>"Officially supported" loans are either guaranteed by the expecting government, directly subsidised, or directly extended. We consider only loans of a duration of one year or more. Shorter term credits are frequently not officially supported in the same way, and only incomplete data were available.

rate than assuming the exporting firms reap most of the benefits. Crane and Kohler (1984) have estimated the price elasticity of import demand by the Soviet Union and by Eastern Europe and found it to be very small, implying that most of the subsidy is transferred to the borrower.

Not surprisingly, our conclusions in Sec. V are rather sobering. Even though the Soviet Union enjoys a subsidy of almost \$1 billion because of official support of OECD credits, it is unlikely to be seriously hurt by a withdrawal of this subsidy. As a tool of "economic warfare" the threat of subsidy withdrawal is unlikely to have more than a symbolic effect. However, there is no need to argue for a discontinuation of the current policy on these grounds. Subsidies are costly to the West no matter what their effects on the Soviet Union or its allies. Any benefits to the exporting industries are more than offset by the total economic costs borne by the other sectors of the economy, which should be sufficient reason to discontinue these wasteful programs.

## II. ESTIMATING THE VALUE OF EXPORT CREDIT SUBSIDIES

### TYPES OF EXPORT CREDIT SUBSIDIES

In this section we estimate the value of the export credit subsidies that are granted by the governments of OECD countries on exports to the Soviet Union, its allies, and the rest of the communist world. To do this, we will consider direct subsidies, whereby a government supports export credits by subsidizing the interest rate directly, separately from indirect subsidies, where the government's involvement does not go beyond providing risk guarantees and insurance to its exporters. For example, if the U.S. EXIM Bank provides direct credits to Romania for the purchase of U.S. made power generating equipment at interest rates below the marginal cost of funds to the EXIM Bank,<sup>1</sup> it directly subsidizes this transaction. If the CCC guarantees loans made to Poland for the purchase of U.S. grain, it indirectly subsidizes these exports.

In addition to the direct subsidy, an EXIM Bank loan also includes an indirect subsidy. By making the loan directly, the U.S. government, through the EXIM Bank, also assumes all the nonpayment risks. To gauge the full extent of the subsidy, we must compare the interest rate paid by Eastern borrowers with what they would have to pay without the support of the Western governments, and not just with the Western government's marginal cost of funds.

In estimating the total value of Western subsidies on loans to the Eastern Bloc we follow a two part strategy. First we estimate the direct subsidy by comparing the typical lending rates with each lending country's risk free interest rates. In a second step we estimate the indirect subsidy by comparing each lending country's risk free interest rate with the rate that Eastern countries would have had to pay without any guarantees from the exporting governments. At each step we take into account the special rules and regulations under which governments support loans and grant guarantees, as well as the dif-

<sup>1</sup>The marginal cost of funds to the EXIM Bank is the rate at which the U.S. treasury can borrow funds (the T-bill rate or the yield on government bonds) plus a small charge to cover transaction costs. In recent years this marginal cost of funds has typically been considerably above the EXIM Bank's lending rate.



ferent guarantee and insurance fees that a lender has to pay and that he presumably will include in his lending rate.

At this stage it does not matter whether the credits we consider were tied to specific products or transactions, or whether the borrower could independently decide how to use them. Such distinctions will become important in Sec. III.

### DIRECT SUBSIDIES

In many OECD countries special government banking institutions are empowered to extend loans to foreign purchasers of export goods at interest rates that are below the government's own cost of funds. The hope is that such preferential financing, which lowers the total costs to the purchaser, will help the export industry to win more contracts. However, in the general competition for export markets, the costs of such programs grew very quickly without leading to much increase in export sales. Primarily under pressure from the United States, the OECD countries have in recent years been negotiating limits on the use of interest rate subsidies for export financing.

The result of these negotiations has been a set of guidelines for officially supported export credits (see Table 1). The guidelines on interest rates and repayment terms ("consensus rates") form part of what is commonly called the OECD gentlemen's agreement, and they

Table 1

#### OECD CONSENSUS RATES (Finance charges in percent per year)

Country Category	4/1/78-6/30/80		7/1/80-11/15/81		11/16/81-7/5/82		7/6/82-10/15/83		10/16/83-Present	
	2-5 yrs.	>5 yrs.	2-5 yrs.	>5 yrs.	2-5 yrs.	>5 yrs.	2-5 yrs.	>5 yrs.	2-5 yrs.	>5 yrs.
I	7.75	8.00	8.50	8.75	11.00	11.25	12.15	12.40	12.15	12.40
II	7.25	7.75	8.00	8.50	10.50	11.00	10.85	11.35	10.35	10.70
III	7.25	7.50	7.50	7.75	10.00	10.00	10.00	10.00	9.50	9.50
	1979		1980		1981		1982		1983	
U.S. Gov. Bonds	9.33		11.39		13.72		12.92		11.34	

SOURCE: U.S. Treasury Department, IMF, International Financial statistics.

NOTE: The country categories comprise: Category I (fairly rich countries) including, since 7/6/82, the Soviet Union, Czechoslovakia and East Germany, who were in category II before; Category II (intermediate countries) including Bulgaria, Hungary, Poland, Romania, Yugoslavia, and—since 7/6/82—Cuba and North Korea, who were in category III before; Category III (fairly poor countries) including China and Vietnam.

are periodically updated. For comparison we have included the yield on U.S. government bonds of similar maturities. As is implied by the name, the gentlemen's agreement and the guidelines are not international treaties, and there are no provisions for enforcing them. Every country reserves for itself the right to deviate from the consensus, in order to respond to "competitive pressures." At best the guidelines provide for some grounds to talk the worst subsidizers into restraining themselves and prescribe a mechanism for the exchange of information. However, they define the limits that can continuously be tested. Typically, the United States cheats by exceeding the maximum repayment terms, a practice possible thanks to the presence of long term fixed interest rate money markets in the United States. Germany tends to lower the interest below what a strict interpretation of the OECD guidelines would allow, and France and Great Britain have a propensity for blending their export credits with foreign aid funds to lower the average financing costs.

What little information there is suggests that the Soviets have skillfully exploited this competition among the exporting countries.<sup>2</sup> But they are by no means the only ones. The Metropolitan Transportation Authority of New York also used this "competitive pressure" reservation when soliciting bids for subway cars. A Canadian producer eventually won the contract thanks to very low cost financing offered by the Canadian government.<sup>3</sup>

Under consensus rates, borrowing countries are classified by per capita income into three categories. Low income countries are granted the most favorable rates, usually one half percentage point below the average, and high income countries pay around one half percentage point above the average. Until July 1982, all the communist countries were classified in Category II, average income. On July 6, 1982, the Soviet Union, Czechoslovakia, and East Germany were reclassified as high income countries. But even the consensus rates for such borrowers are considerably below the cost of funds for some lenders. The East Bloc countries that remain classified in Category II still benefit from the additional subsidy granted to all intermediate countries under the OECD consensus.

The consensus rates are invariant with respect to lending countries. As a consequence, loans made at consensus rates in French francs or dollars, for example, embody a much larger subsidy than comparable Deutschmark or Swiss franc loans because the nominal interest rates

<sup>2</sup>Crevitz, 1983.

<sup>3</sup>U.S. Department of the Treasury, 1982.

in France and the United States have, at least recently, been considerably higher than in West Germany or Switzerland.<sup>4</sup>

In Table 2 we list the average yield on government bonds in 1981 for the different OECD lending countries, which we used as a measure of the risk free interest rate. The volume and maturities of officially supported loans by the different OECD countries to the communist countries are our estimates based on various nonpublic sources. Errors are thus not only possible, but likely. Given the political sensitivity of

Table 2  
AVERAGE YIELD ON GOVERNMENT BONDS  
WITH MATURITIES OF ONE YEAR IN  
SELECTED OECD COUNTRIES, 1981

Country	Average Yield
Australia	13.96
Austria	10.61
Belgium	13.71
Canada	15.22
Denmark	18.92
Finland	10.20
France	15.66
Ireland	17.28
Italy	20.58
Japan	8.66
Netherlands	11.55
Norway	12.31
Portugal	16.71
Sweden	13.49
Switzerland	5.57
United Kingdom	14.74
United States	13.72
West Germany	10.88

SOURCE: IMF, International Financial Statistics, 1981.

<sup>4</sup>In a few countries (e.g. Switzerland), the domestic risk free interest rates were so low that they fell below the consensus rates. In these cases we assume that government supported loans are extended at the government's own marginal cost of funds. Thus the direct subsidy is zero in these cases.

such loans, one suspects that many Western governments tend to understate their volume.<sup>5</sup>

Given these figures, calculating the direct subsidies is quite straightforward. The most common repayment structure in international loans is one where each installment consists of a constant fraction of the original loan amount plus all accrued interest.<sup>6</sup> With this kind of a repayment structure, the present value of all the future payments that a borrower would like to make if the lenders had extended the loans at their own cost of funds (without direct subsidies) is equal to

$$PV_{(no\ subsidies)} = \sum_j \sum_h \sum_{t=1}^{T_h} \frac{L_{ijh}}{T_h} (1 + r_j)^{-t} [1 + r_j(T_h - t + 1)], \quad (1)$$

where  $L_{ijh}$  is the volume of loans extended by lender  $j$  to borrower  $i$  at maturity  $T_h$ , and lender  $j$ 's own cost of funds is given by  $r_j$  (see Table 2). Each term in the summation (1) represents one payment. At time  $t-1$ , principal remaining (or balance) is  $L_{ijh} - (t-1)L_{ijh}/T_h$  (original loan less total principal repayments). Interest due at time  $t$  is therefore  $r_j[L_{ijh} - (t-1)L_{ijh}/T_h]$ , and the total payment due at time  $t$  is this amount plus  $L_{ijh}/T_h$ . This simplifies to

$$[1 + r_j(T_h - t + 1)] L_{ijh}/T_h.$$

Discounted back to the present this payment is worth

$$(1 + r_j)^{-t} [1 + r_j(T_h - t + 1)] L_{ijh}/T_h.$$

The total present value of all future repayments is obtained by first summing all these payments for loans of maturity  $T_h$ , then summing these amounts over all maturities and finally summing the results over all lenders.

If the borrower can borrow at the consensus<sup>7</sup> rate  $c_h$  the present value of his future payments is equal to

$$PV_{(consensus\ rates)} = \sum_j \sum_h \sum_{t=1}^{T_h} \frac{L_{ijh}}{T_h} (1 + r_j)^{-t} [1 + c_h(T_h - t + 1)]. \quad (2)$$

The direct subsidy, defined as the difference between (1) and (2), is given in Table 3 for new officially supported loans received in 1981.

<sup>5</sup>Note that any errors in our estimate of officially supported loans affect the absolute volume of the subsidy given, but not its size relative to the total volume of loans.

<sup>6</sup>Under this kind of a repayment structure, actual payments decline over time. Alternative schedules, with constant or increasing payment amounts are also used sometimes. The results of our analysis are unaffected by which of these schedules is used.

<sup>7</sup>Consensus rates vary by borrower and maturity (see Table 1).

**Table 3**  
**DIRECT CREDIT SUBSIDIES ON NEW LOANS, 1981**  
 (\$ millions)

Borrowing Country	New Credits	Subsidy
USSR	5,763.1	498.1
Bulgaria	219.0	16.4
Czechoslovakia	267.0	23.7
East Germany <sup>a</sup>	1,631.0	94.7
Hungary	99.0	14.4
Poland	2,778.0	338.8
Romania	323.0	41.5
Unallocated	1,299.5	93.9
Subtotal	12,379.6	1,121.5
Cuba	579.0	75.1
Vietnam	28.0	4.9
Yugoslavia	480.0	54.9
China	588.4	82.1
Total	14,005.0	1,338.5

<sup>a</sup>Not including loans from West Germany.

Because we are unable to ascertain which fraction of the new loans supported by the exporting governments was granted at consensus rates and which were granted at what different rates, we have simply assumed that all the officially supported loans were made at the lower of either consensus rates or the exporting government's cost of funds. This assumption is a compromise. On the one hand, probably a fairly large portion of the officially supported export credits was guaranteed, so that the direct subsidy was zero (an example are CCC loans mentioned above). On the other hand, anecdotal evidence suggests that probably another fairly large portion of the export credits was extended by the exporting governments at rates below the consensus.<sup>5</sup> We assume that these two effects offset each other.

#### INDIRECT SUBSIDIES

The value of a guarantee to the borrower is the amount by which it reduces the costs of financing a loan. If, in the absence of an official

<sup>5</sup>"Italy to Buy Soviet Gas: On what Terms?" *East-West*, No. 338, December 20, 1983, p. 1.

guarantee, the borrower would have to pay 10 percent interest, but thanks to a guarantee he is able to borrow at 8 percent, then the value of this subsidy to him is 2 percent of the loan amount per year, or 20 percent of the finance charge. To determine the subsidy due to loan guarantees on loans made by the West to the Eastern Bloc, one must determine the interest rate at which the loans were actually made with the guarantee and compare this rate with what the borrower would have had to pay in the absence of a guarantee.

As pointed out in the previous section, the actual interest rates paid by borrowers of officially supported loans are usually not reported. Similarly, data are lacking on unsupported loans of similar size and maturity that would enable us to make the comparison directly. We are forced to rely on indirect evidence and to make some assumptions, to calculate the hypothetical interest rates.

We assume that lenders in the West are risk neutral and that they would seek to maximize the expected present value of their investments. We assume also that financial markets are competitive, so that the expected return on risky investments will be equal to the certain return on risk free investments. Under these assumptions, the risk bearing interest rate  $k$  will be set such that

$$\sum_{t=1}^T (1+r)^{-t} \frac{L}{T} [1+r(T-t+1)] \quad (3)$$

$$= \sum_{t=1}^T (1+r)^{-t} \frac{L}{T} [1+k(T-t+1)](1-P)^t$$

where  $T$  is the total number of installments,  $L$  is the original loan amount,  $r$  is the risk free interest rate, and  $P$  is the perceived probability of nonpayment per period. We assume that in each period the probability of default is  $P$ ; and that once a borrower defaults, no future payments are received. The left hand side corresponds to the present value of all future installments on a risk free loan, and the right hand side corresponds to the expected present value of installments on a risky loan—the probability weighted present value of the repayments with interest at the higher interest rate  $k$ . Without loss of generality, the ratio  $L/T$  cancels out.

If the lender has access to insurance or guarantees from his government, he can offer an interest rate lower than  $k$ . In fact, under competition, after all rents are eroded, the prevailing interest rate for insured or guaranteed loans ( $d$ ) will be such that

$$\sum_{t=1}^T (1+r)^{-t} [1+r(T-t+1)] - \sum_{t=1}^T (1+r)^{-t} [1+d(T-t+1)] [I[1-i(1+r)] + (1-I)(1-P)^t], \quad (4)$$

where  $I$  is the extent of insurance coverage (the fraction of the loss that the insurer will cover) and  $i$  is the insurance premium per dollar insured. Insurance premiums are collected at the same intervals as loan repayments are made, except one period earlier. Obviously, if  $I=1$  and  $i=0$  (the government covers the risks completely and for free),  $d$  will be equal to  $r$ . For the lender it is exactly as if he was lending to his own government.

Equation (3) is simply Eq. (4) for the case of no insurance coverage ( $I=0$ ). In general, we can thus state that the interest rate charged in the market will be

$$d = \frac{\sum_{t=1}^T (1+r)^{-t} [1+r(T-t+1) - [I[1-i(1+r)] + (1-I)(1-P)^t]]}{\sum_{t=1}^T (1+r)^{-t} (T-t+1) [I[1-i(1+r)] + 1-I)(1-P)^t]} \quad (5)$$

Of all the variables that enter into the determination of  $d$ , only  $P$ , the perceived probability of nonpayment per half year period, cannot be observed.<sup>9</sup> In the following section we describe ways in which we were able to estimate  $P$  indirectly and separately for each Communist country. Since risks commonly tend to be expressed per year, we will also report our estimates of  $P$  as perceived *annual* probabilities of default. For the actual calculations of subsidies on loans with semi-annual installments, we then rescaled these estimates to a semi-annual basis.

Data on  $I$  and  $i$  are published, although incompletely, by the OECD (1981). Table 4 represents our best guesses based on the information from this source and discussions with representatives of some of the

<sup>9</sup>Kohler and Fisher (1983) take into account the value of any assets or future payments that might be recovered in case of nonpayment ("salvage" in the insurance jargon). We do not explicitly include salvage as a separate variable here, primarily because we doubt that it could ever be identified separately from  $P$ . Instead we assume that lenders will adjust their perceptions of risk to allow for any possible salvage.

**Table 4**  
**INSURANCE COVERAGE AND TYPICAL INSURANCE PREMIUMS FOR**  
**GOVERNMENT SPONSORED POLITICAL RISK COVERAGE IN**  
**DIFFERENT OECD COUNTRIES**  
(In percent)

Country	Coverage	Premium <sup>a</sup> (% per year)		
		3 years	5 years	8 years
Australia	95	0.2433	0.2860	0.1788
Austria	100	0.6000	0.6000	0.6000
Belgium	95	0.5467	0.3220	0.4200
Canada	90	1.8333	1.7000	1.6250
Denmark	90	0.5133	0.4730	0.2252
Finland	90	0.3600	0.3400	0.3400
France <sup>b</sup>	90	0.2500	0.2500	0.2500
Ireland	90	0.7700	1.0800	1.0800
Italy	100	0.8100	0.9280	0.5800
Japan	90	0.2650	0.2650	0.2650
Netherlands	95	0.1700	0.1100	0.1000
Norway	95	0.7500	0.3000	0.3000
Portugal	95	0.2200	0.2500	0.2500
Sweden	95	0.3500	0.3500	0.3500
Switzerland <sup>c</sup>	60-95	0.4400	0.3440	0.2750
United Kingdom	100	0.7500	0.4500	0.2813
United States (EKIM Bank)	100	0.5013	0.5013	0.5013
West Germany	90	0.7000	0.6000	0.6000

SOURCE: Compiled from information in OECD, 1982.

<sup>a</sup>Fixed fees such as application or commitment fees have been spread over the length of the contract.

<sup>b</sup>France also charges a separate premium, which is kept confidential and varies by importing country.

<sup>c</sup>Switzerland varies its coverage (for the same premium) to reflect the difference in risk among borrowers.

official export credit insurance agencies. In the cases where the insurance premium  $i$  varies with maturity we have recalculated  $d$  for each possible maturity. If we can estimate the perceived risk,  $P$ , we can calculate both the insured and the risk bearing interest rates and determine the indirect subsidies.



## ESTIMATING THE PERCEIVED RISK

### Actuarial Estimates of Risk

Actuarial estimates are often useful in situations where risks are generated by an exogenous random process. Actuaries, in effect, use the frequency of an event as observed in the past to infer the probability that it will occur again. Unfortunately, the framework of international finance does not satisfy many of the basic assumptions necessary for inferring the future from the past in this way.

Kohler (1984) has shown that the probability of default is not independent of the presence of insurance and other institutional factors. International loans are extended in the absence of supranational governments that might be able to enforce loan contracts. In this situation, willingness, in addition to ability to repay, becomes an important factor.

When deciding whether to honor an obligation, the borrower takes into account the current situation as well as the lender's probable reaction to nonpayment. The reaction by an insured lender, especially if the insurer is a government, is likely to be much less negative than the reaction of a lender who would have to absorb the entire loss himself. Accordingly, borrowers are more likely to default on insured loans than uninsured ones.<sup>10</sup> The terms and conditions of the insurance policies themselves influence the probability of a loss occurring.

Other influences continuously change. The overall political climate and short term political goals are likely to have a considerable influence on a country's willingness to pay. In particular, if a borrower knows that he will not be granted any further loans, and if he already faces severe sanctions unrelated to his credit performance, he has very weak incentives to repay any loans. Such changes in political climate, and payment decisions based on expectations about the future, can never be captured in actuarial estimates.

Attempts to examine the past performance of particular debtors are made very difficult because of the way official insurers of foreign credit risks keep their books. Private insurers of political risk might be better sources of data; however, they jealously guard the confidentiality of their insurer-client relationships.

The biggest mistake the EXIM Bank and similar institutions in the United States and elsewhere have made in their insurance accounts is that they keep such accounts on a simple cashflow basis. Losses are

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<sup>10</sup>Private insurance companies are perfectly aware of this and therefore require that buyers of their policy not disclose its existence to the borrower.

not charged to specific policies. At the end of the year, the EXIM Bank simply compares losses paid (guarantees and insurance policies honored through the purchase of bad loans) during that period with premiums collected during the same period. But the premiums collected ought to cover future losses, and the losses paid out now should be compared with premiums collected on these policies in the past. If these sorts of calculations are not done, cashflow accounts may continuously show profits, as long as business is expanding, even though the insurer is losing money on all the policies he writes.

In the case of the EXIM Bank, this tendency of understating losses is compounded by a policy of not writing off or discounting bad loans. Between 1975 and 1980, the EXIM Bank wrote off loans only in two years, 1975 (\$6,300) and 1978 (\$4.8 million). Delinquent installments in 1975 totaled \$115 million, and by 1980 they had risen to \$494 million. Any accruing but uncollected interest is credited to reserves. Only recently have some loans been declared nonperforming, and the interest accrual has been stopped. Nevertheless they still figure as assets in the EXIM Bank's books, including such securities as loans to Castro's predecessor in Cuba, and to the former nationalist regime in Peking.

On loans to Communist countries, the EXIM Bank is obligated by Congress to submit an annual report on their status. From these reports it is possible to calculate the scheduled repayments and determine the extent to which these repayments were not made. Table 5 compares these figures for the EXIM Bank with those for the West German loan guarantee program.

In some circumstances, delinquent payments are simply behind schedule, and they eventually arrive. It is not possible to adjust the available data properly for these recoveries. However, if we simply reduce delinquent payments in a specific year by the amount of earlier delinquent payments recovered in that year, the figures are slightly smaller (about one percentage point).

It is astonishing how much better Hermes appears to fare. Two things might explain this phenomenon: First, Hermes provides its policyholders with incentives for avoiding default, primarily through a coinsurance requirement that is much higher than in the United States. Kohler (1984) has postulated that losses are inversely related to the coinsurance requirement, and Table 5 might be seen as providing some circumstantial evidence for supporting this claim. Second, the EXIM Bank's portfolio is heavily burdened by loans to Poland and Romania, and loans to the Soviet Union are declining in importance since the Jackson-Vanik amendment was passed by Congress. It is possible that Hermes' portfolio contains a larger proportion of loans to

Table 5

**DELINQUENT INSTALLMENTS ON LOANS TO CENTRALLY  
PLANNED ECONOMIES BY EXIM BANK AND HERMES**  
(In percent of scheduled payments)

Year	EXIM Bank		Hermes	
	All CPEs	All CPEs Except Yugoslavia	All CPEs Except Yugoslavia	All Countries
1975	2.7	0.0	.3	.7
1976	.4	4.0	.5	1.0
1977	7.2	22.7	1.5	1.2
1978	10.4	5.0	.7	1.2
1979	16.3	2.0	1.2	3.7
1980	38.0	19.4	.5	4.6
1981	52.1	21.4	8.8	4.5
1982	69.2	74.2	N.A.	N.A.

N.A.: Not available.

the Soviet Union which has maintained an immaculate repayment record. Hermes does not publish data on individual borrowing countries, so such reasoning can be no more than speculation.

Although it might be possible to obtain better estimates of past loss frequencies given better data, we doubt that such an exercise would be very useful for predicting future loss probabilities. Even if we were able to calculate precisely how frequently a country or a group of countries has caused loan losses, we would still have to take into account the changing circumstances in which nonpayment may occur. It is possible to arrive at better estimates of perceived default risks directly, by analyzing the various ways in which agents in the financial markets protect themselves against those risks, and by the surcharges they demand as compensation for assuming the risks of nonpayment by international borrowers, especially in the Eastern Bloc.

#### Estimating Implicit Risks from Insured Loans

Most official insurers do not cover the entire payment that a lender expects. The EXIM Bank is an exception. Under most programs, the lender is required to carry a small fraction of the risk himself. This coinsurance requirement implies that even insured loans are not entirely risk free; and as a consequence, lenders demand a small surcharge over the risk free rates even if the loan is insured or guaranteed.

From this surcharge it is possible to infer the implicit risk assumptions that a lender is making. In practical terms this simply involves solving Eq. (5) for  $P$ . Kohler and Fisher (1983) did this using data on CCC loans granted to Poland in 1979/80. CCC loans usually run for three years, with equal semiannual principal repayments. Kohler and Fisher treated these as equivalent to a 1.75 year loan with a single repayment. They arrived at an estimate of  $P$  equal to .081. The estimate obtained by Kohler and Fisher amounts thus to a  $P$  of 4.73 percent per year.

Unfortunately, not much data of this sort are publicly available. Guarantees granted by the EXIM Bank, for example, have no coinsurance requirement, so these kinds of calculations cannot be performed. An additional problem is that lenders might view the residual risk on a loan that is otherwise guaranteed by their government differently from the risks of a loan in the same amount where the government is not involved at all. Nevertheless, the estimate cited above falls right in with other estimates of perceived risks and thus adds to the confidence that we can have in the estimates used in the actual calculations.

### **Premiums on Private Insurance Policies**

Private insurance companies underwrite roughly one third of the political risk insurance business in the United States. Unlike official insurers of political risks, private companies differentiate among different borrowers and lenders in the rates they charge. Furthermore, they require confidentiality of their policies, demand much higher collateral, insist on coinsurance, and generally follow business practices that appear to reduce their losses below those of government owned insurance companies. It is therefore reasonable that the risks implicit in the insurance premiums private companies charge are smaller than most other measures of perceived risks.

Kohler and Fisher (1983), for example, compute an implicit risk for three year loans to the Eastern Bloc of around 3.7 percent. The data they use are insurance premiums quoted by officials of private insurance companies during the summer of 1982. Bad risk countries, such as Poland, Romania, North Korea, etc., are explicitly excluded. This figure implies a  $P$  of approximately 2.13 percent per year.

### **Surveys and Interviews**

The most famous of the country risk surveys is the one conducted semiannually since 1979 by the publication *Institutional Investor*.

Questionnaires are sent to middle and upper level executives in U.S. firms that conduct a substantial portion of their business abroad. The executives rate the creditworthiness of all countries on a scale of 1 to 100. In Table 6 we have reproduced the ratings for the Communist countries since 1979, as well as their rank relative to the approximately 100 countries listed.

The perceived creditworthiness of the Communist countries has deteriorated substantially over the past few years. They rank far behind many developing countries and newly industrialized countries with lower per capita income, such as Algeria, Malaysia, South Korea, and Taiwan. In 1983, Romania, Poland, North Korea, and Cuba fell into the lowest quartile, along with such countries as Nicaragua, Zaire, Iran, and Sudan. Vietnam was not even ranked. Even the Soviet Union, which initially was in position 17 (1979) dropped 10 positions by 1981 and is today ranked behind China.

The *Institutional Investor* ratings are useful for obtaining an impression of the relative riskiness of all the countries in the world, as perceived by the respondents to the survey. The responses probably provide a good impression of the market's "gut feelings." However, they also depend on who does the ranking. A similar survey conducted by a Japanese journal<sup>11</sup> among Japanese businessmen, for example, ranks the Soviet Union unambiguously ahead of China. This indication that Japanese businesses consider China more risky than the Soviet Union, while U.S. businesses see the ranking as either indeterminate or reversed, supports the notion that country risks are never completely independent of the lender.

Risk assessments are not readily translated into measures of probability of default, and thus into interest rates that would be charged in the absence of official guarantees. In our interviews with private bankers, traders, and insurers in the United States as well as in Europe, we found very few who were willing to put actual numbers on these subjective estimates of risks. Nevertheless, this nonscientific informal survey of about two dozen individuals yielded some interesting anecdotal information on how the private market perceives the risks of lending to Eastern Europe and the Soviet Union.

Unanimously, the Soviet Union was ranked in first place. The general perception was that primarily because of its large gold reserves, the Soviet Union would have no difficulty meeting its debt service payments. Nevertheless, there was some residual doubt as to the Soviets' willingness to pay in all circumstances. West European bankers can

<sup>11</sup>*Nihon Keizai Shinbun* survey of 100 leading Japanese enterprises, quoted in *The Japan Economic Journal*, September 1, 1981.

Table 6  
INSTITUTIONAL INVESTOR COUNTRY CREDIT RATING SURVEYS

Communist Country	Sept 1979		March 1980		Sept 1980		March 1981		Sept 1981		March 1982		Sept 1982		March 1983	
	Rank	Rating	Rank	Rating	Rank	Rating	Rank	Rating	Rank	Rating	Rank	Rating	Rank	Rating	Rank	Rating
USSR	17	78.8	26	71.5	27	69.7	27	69.6	27	68.0	26	65.6	27	60.5	28	59.7
Belarus	—	—	—	—	57	47.7	56	47.4	58	45.5	58	41.9	57	39.8	53	39.1
Czechoslovakia	36	62.6	36	60.7	35	59.7	38	57.6	45	55.1	46	51.6	50	46.1	48	43.1
East Germany	—	—	34	61.4	32	60.3	36	58.4	44	55.4	45	51.9	49	56.5	51	41.3
Hungary	35	62.6	38	59.4	41	58.3	39	57.4	47	54.7	42	52.5	45	48.5	46	45.5
Poland	59	49.5	67	41.6	71	37.1	74	32.9	84	19.5	93	12.9	101	8.8	100	8.3
Romania	47	54.8	53	52.6	54	51.9	51	51.2	60	45.1	73	30.4	79	20.1	84	16.1
Cuba	—	—	76	32.2	77	30.3	77	28.6	77	23.1	78	20.5	84	17.1	94	11.9
North Korea	—	—	93	10.9	96	8.5	98	7.0	103	5.1	106	4.3	106	5.0	106	4.4
Vietnam	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Yugoslavia	46	57.5	51	53.4	53	52.1	52	50.3	54	47.4	61	40.3	60	38.4	66	33.7
China	27	71.1	20	73.7	24	72.2	24	71.2	28	67.4	27	64.4	26	61.8	22	61.1

envision a set of circumstances in which the Soviet Union might be tempted to withhold repayments for economic or political reasons. On balance, most people who were willing to cite specific figures thought that the Soviet Union should be able to raise short term loans at rates around 1.5 to 1.75 percentage points above the London interbank offer rate (LIBOR). This implies a perceived default probability of around 1.5 percent. For medium and long term loans, these figures would be somewhat higher.

In the next category were Czechoslovakia, Bulgaria, and Hungary. Rates for this group were quoted between 3.5 and 4 percent above LIBOR, implying a perceived default probability of around 3.5 percent on short term loans.<sup>12</sup> Czechoslovakia would be in a better position except for the fact that many observers consider its industrial capital stock to be old. They foresee large borrowing needs to update the Czech infrastructure in the near future. Bulgaria has a very small foreign debt and a very tightly controlled regime. It is also self-sufficient in food. It is generally believed that Bulgaria would have no difficulty if it stopped importing altogether, if necessary. Hungary receives quite a bit of credit for the recent displays of flexibility in its economic organization, and this accounts for its generally good credit standing. Many observers believed that Hungary has a fairly good chance of realizing sustainable economic growth in the future.

Different observers place East Germany in different positions. Some believed that thanks to its very disciplined work force and generally high industrial productivity it deserved a good credit report, maybe even ahead of Czechoslovakia. No disturbances similar to those in Poland are expected. Others noted the high costs of the East German surveillance apparatus and were generally concerned that the East German population, which is exposed daily to the West German example, might ultimately lose its docility and thus its industriousness and discipline. Observers who were willing to go out on a limb placed East Germany's credit rating on a level with or immediately below Hungary's.

Polish and Romanian risks were almost unanimously considered "nonbankable." Only a grain trader stated that he was providing credit to these two countries, but at interest rates that implied perceived default risks of close to 10 percent. He stated that his repayment experience with all East Bloc countries had been very good, and he also

<sup>12</sup>Until recently, many observers would have assumed that the risks on all East Bloc countries were the same as for the Soviet Union. It was believed that in case of repayment difficulties, the Soviets would assist their satellites. This so-called "umbrella theory" was thoroughly discredited by recent experience.

provided an explanation: As a private grain trader he has no constraints whatsoever to cut off shipments to nonpaying customers. Furthermore he has repeatedly demonstrated his willingness to take such actions. In other words, his clients know that if they do not pay him, they will receive no more grain. If he was insured by a Western government he is certain that he would not be paid as promptly, because the borrower knows that the trader would be reimbursed by the government and would thus have less incentive to cut off shipments. As the trader put it: "You can always default to the government; you can usually get away with defaulting to the bank; but you should never default to your grocer."

This observation is consistent with a model of rational behavior by borrowers in international markets. It reinforces the point that defaults are not random events out of the control of both lenders and borrowers but are the consequence of decisions by rational individuals weighing the pros and cons of their actions. One immediate conclusion is that lenders should take care to give their borrowers the kinds of incentives that will lead them to honor their obligations. Kohler (1984) discusses ways in which this can be done. Another conclusion is that at any time different lenders will face different default risks, even from the same borrowers.<sup>13</sup> This is one of the reasons why historical actuarial experience is not necessarily the best source for evaluating these risks. The next section discusses what we consider to be the best source for inferring the average default risks, as perceived by the private market.

### **Forfaiting Discounts**

Unlike American banks, European banks are allowed to discount commercial paper and give up—"forfait"<sup>14</sup>—the right of recourse to the seller in case of nonpayment. For example, if an exporter exports to the Soviet Union on credit, he can take this account receivable to a bank and sell it at a discount. The bank assumes all risks. If the Soviet Union does not pay, the bank has to absorb the loss. Because such a forfaiting transaction involves the bank taking title to the obligation, it is illegal under current U.S. banking regulations.

Finanz AG in Zurich, a subsidiary of the Schweizerische Kreditanstalt and a frequent user of forfait in the European market, publishes the rates at which it is willing to discount foreign IOUs at irregular

<sup>13</sup> Apparently Western governments face much higher than average default risks from East Bloc borrowers (Kohler, 1984).

<sup>14</sup> European banks use the French spelling *forfait* so that is what is used here.



intervals. These discounts, expressed in percent per year to maturity, vary by borrower country. Finanz AG usually requires a repayment guarantee by the importing government. Its discounts thus reflect purely political risks. But unlike survey or interview data, these discount rates reflect actual (offer) prices of investors willing to assume the risks. Put bluntly, Finanz AG and its investors are willing to put their money where their mouth is.

One difficulty with these kinds of data is a threshold effect. If the perceived risks for a particular country exceed a certain level, Finanz AG is no longer willing to accept this particular country risk. In our data this shows up as a missing observation.<sup>15</sup> There are also no satisfactory data available on Hungary, but for a different reason. One of Finanz AG's major competitors in Europe is the Hungarian International Bank in London, a branch of the Hungarian Central Bank. Hungary thus does its own forfeiting.<sup>16</sup>

By combining the forfeiting discounts with data from other sources, it is possible to fill in the blanks. The institutional investor ratings, thanks to their completeness, are a convenient complement to the forfeiting data. Table 7 presents the results from regressing the default probabilities implicit in the forfeiting discounts on the institutional investor ratings. The fit is quite close ( $R^2 = .67$ ), indicating that the

Table 7

REGRESSING PERCEIVED RISKS FROM FORFEITING DATA  
ON INSTITUTIONAL INVESTOR RATINGS  
(Absolute t-ratios in parentheses;  $R^2 = .669$ )

Dependent Variable: $\log(P)$ Independent Variable: Institutional Investor Rating			
	Centrally Planned Economies	OECD Countries	Rest of the World
Intercept:	-1.0272 (3.9)	-1.2218 (10.4)	-1.3453 (14.9)
Slope:	-.048973 (11.7)	-.04823 (32.1)	-.0440 (30.5)

<sup>15</sup>In some instances the borrowing country may try to place restrictions on the secondary market in its IOUs, as the Soviet Union attempted in 1982. In this case the data may also be missing, even though the perceived risks are not necessarily above the threshold. Such restrictions are usually removed rather quickly, as borrowers begin to realize that their primary effect is to increase their own borrowing costs.

<sup>16</sup>*The Economist*, London, December 16, 1983.

ratings explain about two thirds of the variation in the logarithm of the implicit default probability. The ratings also tend to understate CPE risks somewhat, relative to OECD risks and to those of the rest of the world. In March 1983, for example, the unweighted mean rating for all countries included in the *Institutional Investor* survey was about 42.2. This rating corresponds to a  $P$  of 4.53 percent for a centrally planned economy (CPE) country, 3.85 percent for an OECD country, and 4.07 percent for a country not counted in either of these two groups (Rest of the World).

We use these regression results to predict default probabilities for the countries and dates where the forfeiting data are not available, giving us a more complete picture of the market's perceptions of risk. In Table 8 we have listed the perceived default probabilities as calculated from the forfeiting data. Missing values were replaced by predictions from the regression on the institutional investor ratings. To identify these predicted values, we have put them in parentheses.

In Table 9 we have ranked all the countries by their perceived default probabilities as of March 1983, and for comparison we have also listed the corresponding values for March 1981. Countries for which no forfeiting data at all were available were excluded, except if they were part of the CPE group. In this case they were included, using the values fitted from the *Institutional Investor* regression. The grouping into different risk categories is arbitrary, and its only purpose is to facilitate cross country comparisons. The private market obviously does not consider the communist countries to be particularly

Table 8  
PERCEIVED RISK ( $P$ ) FOR CPEs  
(Percent per year)

Country	Mar.'79	Sep.'79	Mar.'80	Sep.'80	Mar.'81	Sep.'81	Mar.'82	Sep.'82	Mar.'83
USSR	1.02	0.76	1.19	1.39	2.17	1.69	1.35	(1.85)	(2.32)
Bulgaria	1.55	1.63	2.61	2.97	3.75	(3.86)	(4.60)	(5.10)	(4.12)
Czechoslovakia	2.09	1.41	1.69	2.26	2.89	4.18	(2.86)	(3.74)	(4.34)
East Germany	2.09	1.36	1.68	2.26	2.89	4.30	(2.82)	(3.67)	(4.74)
Hungary	—	(1.67)	(1.95)	(2.06)	(2.15)	(2.46)	(2.74)	(3.33)	(3.86)
Poland	2.59	2.80	(4.67)	(5.82)	(7.15)	(13.78)	(19.03)	(23.27)	(23.84)
Romania	2.09	1.85	2.25	2.75	3.49	(3.93)	(8.06)	13.36	(16.27)
Cuba	—	—	(7.40)	(8.12)	(8.82)	(11.55)	(13.12)	(15.50)	(19.99)
China	.51	.55	.63	.71	1.63	1.62	1.60	1.42	(1.90)
Yugoslavia	2.97	2.29	2.80	3.87	(3.06)	(3.51)	(4.97)	(5.46)	(6.67)

NOTES: Computed from forfeiting discounts as published by Finanz AG Zurich. Values in parentheses were fitted from *Institutional Investor* ratings.

**Table 9**  
**IMPORTING COUNTRIES GROUPED BY PERCEIVED RISK, 1983**

Risk Group	Country	March '81	March '83
Very Low Risk	Japan	—	—
	Switzerland	—	—
$P < 1\%$ per year	West Germany	—	—
	United States	—	.07
	Canada	.46	.23
	Netherlands	.47	.24
	Austria	.41	.25
	Norway	.30	.29
	United Kingdom	.58	.33
	Singapore	.41	.33
	Australia	.41	.37
	Belgium	.77	.38
	Sweden	.77	.49
	Hong Kong	.41	.51
	France	.52	.66
	Finland	.77	.70
	New Zealand	.77	.75
	Italy	1.08	.83
	Taiwan	3.00	.90
	Malaysia	3.22	.99
Moderate Risk $1\% < P < 2\%$ per year	Spain	1.99	1.15
	Ireland	(.86)	1.21
	Denmark	1.04	(1.24)
	South Africa	1.87	1.27
	China	1.63	1.30
	Saudi Arabia	.77	1.32
	Kuwait	1.51	1.40
	Algeria	(2.06)	1.48
	Iceland	(1.74)	1.61
	Greece	1.19	1.62
	Portugal	2.21	1.63
	South Korea	2.97	1.86
	Tunisia	3.49	1.89
	United Arab Emirates	1.94	1.98
Medium Risk $2\% < P < 4\%$ per year	Venezuela	1.56	(2.08)
	Trinidad & Tobago	(2.17)	2.24
	USSR	2.17	2.32
	Colombia	3.86	2.32
	Thailand	(2.62)	2.75
	Brazil	4.05	(3.14)
	Chile	2.57	3.76
	Hungary	(2.15)	(3.86)

Table 9—continued

Risk Group	Country	March'81	March'83
High Risk	Bulgaria	3.71	4.12
	Czechoslovakia	2.89	(4.34)
4% < P < 7% per year	Paraguay	(3.44)	(4.36)
	East Germany	2.89	(4.74)
	Panama	2.88	(4.79)
	Mexico	1.19	(5.14)
	Ivory Coast	(3.72)	(5.20)
	Philippines	4.82	(5.41)
	Peru	4.11	5.61
	Ecuador	3.66	5.96
	Argentina	2.66	6.58
	Iraq	(3.68)	(6.66)
	Yugoslavia	(3.05)	(6.87)
	Morocco	(4.54)	(6.90)
<hr/>			
Mean excluding Nonbankable Risk		(0.193)	(.0226)
<hr/>			
Nonbankable Risk	Iran	(14.25)	(14.19)
	Bolivia	(9.94)	(15.23)
	Romania	3.30	(16.27)
	Cuba	(8.82)	(19.99)
	Poland	(7.15)	(23.84)
<hr/>			
All countries listed	Mean	.0238	.0329

NOTE: Calculated from forfaiting discounts as published by Finanz AG Zurich. Values in parentheses were fitted from *Institutional Investor* ratings.

creditworthy. Only the Soviet Union and Hungary (just barely) make it into the same risk group as Thailand and Brazil, for example. Most other CPEs are found in the same group as Mexico, Panama, or the Ivory Coast. Romania, Cuba, and Poland make up the very end of the listing. Most of the excluded countries, however, would fall into the high and nonbankable risk groups as well.

#### The Value of Indirect Subsidies

Using the forfaiting data for 1981 as augmented by the *Institutional Investor* ratings we can calculate the interest rate that each borrower would have had to pay in 1981 given his particular *P* at that time and

assuming no government guarantees (evaluate Eq. (5) for  $I = 0$ ). Then we calculate the interest rates that each borrower must have paid, given the same  $P$  and each lending country's particular coinsurance rate  $(1 - I)$  and insurance premium  $i$ . (See Table 4.) The difference in the discounted value of the finance charges evaluated at these two rates is the value of the indirect subsidy. The formula for calculating this present value is analogous to the formula for the direct subsidy.

The results of these calculations are listed in Table 10. They depend, of course, on which particular  $P$  is chosen. For 1981 we have two values of  $P$  for each country, one for March and one for September. Over the course of this year the credit ratings for most Communist countries slipped considerably and the indirect subsidies increased accordingly. We have calculated the indirect subsidies for both values of  $P$ , to give an impression of the variability of our estimates. For the total subsidy in the last column of Table 10, we have averaged these two sets of estimates and added the direct subsidies from Table 6.

The total value is substantial, amounting to over 20 percent of total credits granted in 1981. These subsidies represent a cost to the Western economies that is reflected through higher domestic prices and interest rates. In Sec. III we will investigate the arguments that have been advanced to justify such subsidies on the grounds that they increase welfare in the exporting country in spite of their economic costs.

**Table 10**  
**INDIRECT AND TOTAL SUBSIDIES ON NEW LOANS GRANTED IN 1961**  
 (\$ millions)

Indirect Subsidy Based on P as of <sup>a</sup>						
Borrower	New Credits <sup>b</sup>	March 1961		September 1961		Total <sup>c</sup> Subsidy
		P	Subsidy	P	Subsidy	
USSR	5,763.1	2.17	286.5	1.69	217.4	750.1
Bulgaria	219.0	3.71	22.3	(3.86)	23.2	39.3
Czechoslovakia	267.0	2.89	15.2	4.18	22.4	42.5
East Germany <sup>d</sup>	1,631.0	2.89	137.8	4.30	267.6	297.4
Hungary	99.0	(2.15)	5.9	(2.46)	6.9	20.8
Poland	2,778.0	(7.15)	470.0	(13.78)	818.7	983.2
Romania	323.0	3.30	35.6	(3.93)	42.4	81.5
Unallocated	1,299.5	5.16 <sup>e</sup>	210.6	9.17 <sup>e</sup>	413.0	405.7
Subtotal	12,379.6		1,183.9		1,811.6	2,620.5
Cuba	579.0	(8.82)	105.5	(11.60)	133.7	194.7
Vietnam	28.0	(8.82) <sup>f</sup>	5.3	(11.60) <sup>f</sup>	6.8	11.0
Yugoslavia	480.0	(3.05)	31.9	(3.51)	36.9	89.3
China	538.4	1.63	23.1	1.32	17.1	102.2
Total	14,005.0		1,349.7		2,006.1	3,017.7

<sup>a</sup>Risks from forfeiting discounts; values in parentheses were fitted from *Institutional Investor* ratings.

<sup>b</sup>See Table 3.

<sup>c</sup>Mean of indirect subsidies plus direct subsidies from Table 3.

<sup>d</sup>West German loans to East Germany are not included.

<sup>e</sup>Weighted average of all East European risks.

<sup>f</sup>Neither forfeiting nor *Institutional Investor* data available. Assume same risks as for Cuba.

### III. THE EFFECTS OF EXPORT SUBSIDIES ON THE WESTERN ECONOMIES

Most of the different arguments that have been advanced to justify export subsidies on economic grounds we find to be either fallacious or inapplicable to East-West trade. Appendix B outlines an argument that might justify subsidies on exports to the Soviet Union on strategic grounds—i.e., some types of export subsidies, although economically harmful to the West, might provide incentives to the Soviets to behave in a manner consistent with our strategic goals.

#### COMPARATIVE STATIC ARGUMENTS

##### The Standard Case

In the standard model of foreign trade it is straightforward to show that export subsidies are never in the exporting country's interest. In the left panel of Fig. 1 we have drawn regular demand and supply curves for the domestic economy. In the right panel we have drawn the derived export supply curve. This curve represents the quantities that domestic producers will produce in excess of domestic demand, as the world price of their output rises above the closed economy equilibrium price  $P_c$ . Geometrically, it is equivalent to the horizontal distance between the domestic supply and demand curves.

If world demand is sufficiently large, the world demand curve will intersect the export supply curve at a price higher than  $P_c$ , say  $P_w$ , and the quantity  $X$  will be exported.<sup>1</sup> Although the price of the export good increases, reducing consumer welfare (consumer surplus) by the area  $P_c - A - B - P_w$ , the new world market for the export good raises the real incomes of labor and capital sufficiently that all members of society are better off. Export industries are able to sell more at a higher price. Their increase in welfare (producer surplus) is

<sup>1</sup>At this point we assume that the exporting country has some market power; it can influence the world market price. If the exporting country is in perfect competition with all other countries, it faces a perfectly horizontal demand curve. All subsequent results still hold and are even reinforced.

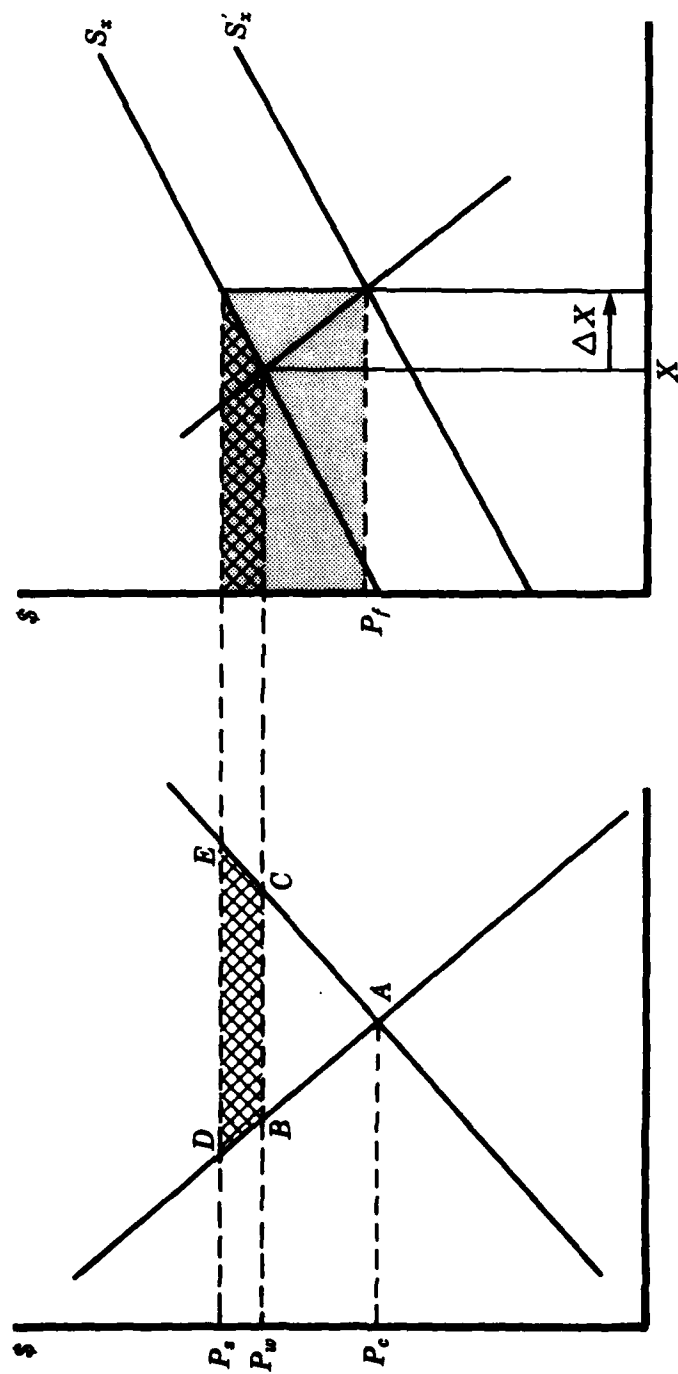


Fig. 1—Welfare losses due to export subsidies



represented by the area  $P_c - A - C - P_w$ . As is evident, producers gain more than consumers lose, hence the standard result that unsubsidized exports improve a country's overall welfare.

Consider now the introduction of export subsidies. They shift the export supply curve downward to  $S_x'$ . Exports increase by the amount  $\Delta X$ , because the price paid by the foreign purchasers has fallen to  $P_f$ , and the price received by the domestic producers increases to  $P_s$ . As a consequence, the producers' welfare increases by the area  $P_w - C - E - P_s$ , and the consumers' welfare is reduced by the area  $P_w - B - D - P_s$ . If the subsidy were costless, we would have a net increase in welfare equal to the area  $B - C - E - D$ , which is cross hatched in both panels of Fig. 1. However, the costs of the subsidy are equal to the shaded area in the right panel of Fig. 1 and are obviously larger than the benefits. In sum, export subsidies increase the welfare of the domestic producers and reduce the welfare of domestic consumers and taxpayers (who bear the cost of the subsidy). The welfare losses of consumers and taxpayers are larger than the welfare gains of the producers, so the subsidies reduce overall welfare in the domestic economy.<sup>2</sup>

If export markets are perfectly competitive, the exporting country faces a perfectly horizontal demand for its exports. We can construct exactly the same diagrams as for Fig. 1, except with a horizontal demand curve in the right panel. We find that the price increase will be more pronounced, the cross hatched area increases and the total cost of the subsidy increases. However, the costs of the subsidy still clearly outweigh the benefits.

These arguments assume an efficiently operating domestic economy. Kohler and Fisher (1983) have shown that if the domestic economy is underemployed, subsidies may increase overall welfare in some cases. However, in most cases, a general production subsidy is superior to an export subsidy. The reason is clear. Thanks to the subsidy, resources that might otherwise have been wasted find employment and produce output. No one is willing to pay the full price for this output, so the government in effect buys some of it and gives it away. If circumstances are such that giving it away to foreigners might improve domestic welfare, then domestic welfare would be improved even more if the government gave the output to domestic consumers.

<sup>2</sup>A corollary of this result is, of course, that in the case depicted here, an export tax will lead to a net welfare increase. But such export taxes might be unconstitutional in the United States.

### Special-Case Arguments for Export Subsidies

There may be special circumstances where the free market fails to properly reflect the costs and benefits of economic activities. If, for example, the exporting firms provided a benefit to society that was not reflected in the prices they receive for their products, subsidies might be justified. Salant (1984) has investigated some of these arguments and concludes that these justifications, although theoretically correct, are probably of little practical relevance.

The "special case" arguments all depend on one firm's activities providing positive externalities for other firms in the economy. For example, if through exporting a firm is able to learn better production technologies, make technological advances, or acquire other useful knowledge, and if this knowledge becomes a public good available to all firms, then the prices that the firm receives in the unsubsidized export market fail to fully reflect the social worth of its activities. It is most doubtful, however, that this argument could justify the subsidies on loans to the Eastern Bloc. Of the over \$123 million in loans to Eastern Europe committed by the EXIM Bank in 1980, almost half (45 percent) was for general bank lines of credit. Lending for the purchase of traditional plant and equipment for power production and distribution, transport, and heavy to medium industry amounted to another 45 percent. World wide lending to finance purchases from U.S. telecommunications equipment and computer manufacturers in 1980 amounted to less than 10 percent of the EXIM Bank's portfolio.

But even if export subsidies were targeted to pioneer industries, they would represent at most a second-best solution. As in the case of subsidies to maintain jobs, they are inferior to general production subsidies, which lower domestic as well as world prices. Export subsidies lower prices paid by foreigners and increase prices in the home market.

Another special case argument that is often advanced is based on complementarity in consumption of two export goods produced by the same country. Salant (1984) has calculated conditions under which it might be beneficial for a government to subsidize one of the complements, because the increased profits on the other good more than offset the losses on the first good. However, we were unable to find any evidence of this sort of a strategy in the lending policies of any of the official export promotion programs in the OECD countries considered.

Occasionally, EXIM Bank press releases will allude to the estimated future business in spare parts that a particular export sale might create. This argument overlooks the fact that if the future benefits from such spare parts sales would be large enough to warrant subsidizing the price of the original equipment, the manufacturer could do so

without recourse to the government.<sup>3</sup> The complementarity argument holds only if firms are unable to internalize the externality themselves. If the same firm produces two complementary goods, as is usually the case with equipment and spare parts, then the externality, if indeed there is one, is internalized by definition. But even if two independent U.S. firms produce the two goods, there is no reason to expect that the positive externalities will stop at the national boundaries. Some of the increased demand for the complementary good may lead to increased sales by foreign firms, not only by U.S. firms.

## DYNAMIC ARGUMENTS

### Market Power on the Seller Side

In the previous section we analyzed economic effects of export subsidies in a static environment and ignored such strategic considerations as maintenance of market shares etc. This assumption may not accurately describe the circumstances in the markets for many products that enjoy export subsidies from the different OECD governments. The exporters to the Soviet Union and its allies are more accurately described as uncooperative oligopolists who, with the help of their governments, compete against each other for market shares.

In such an environment, it is often argued, an individual country has no choice but to participate in the export subsidy competition, lest its export industries be driven out of the market altogether. Kohler and Fisher (1983) have argued, however, that subsidization in response to a foreign government's subsidy makes little sense. If, for example, U.S. industries lose contracts to subsidized foreign competitors, we are indeed being harmed, but the harm cannot be offset or even reduced by U.S. subsidies of our exports in return. If such a retaliatory subsidy were likely to improve U.S. welfare, it would do so regardless of any foreign subsidies. Kohler and Fisher conclude that overall net benefits from subsidizing U.S. exports are negative if the United States imposes them first, so they are probably also negative if subsidies are imposed in retaliation.

This result runs counter to work done by other researchers in this area. Brander and Spencer (1983), for example, have shown that for the case of one exporting firm in each of two exporting countries, one exporter could improve his welfare by subsidizing his exports. The two

<sup>3</sup>The argument that a firm that could reap scale economies should receive export subsidies suffers from the same fallacy: If such benefits were worthwhile, the firm itself would capture them even in the absence of government intervention (Salant, 1984).

countries find themselves in a sort of prisoner's dilemma. They are both best off if neither of them subsidizes its exports. However, because each is trying to improve its position at the expense of the other, they will both extend subsidies to their export firms. In the equilibrium, both countries grant subsidies. Each is thus better off than without subsidies, given that the other subsidizes, but jointly they are worse off.

Brander and Spencer assert that their result will hold for more than two countries and more than one exporting firm in each. However, Salant (1984) has shown that this is not necessarily true. Where more than one firm is engaged in exporting from one country, it may no longer be in that country's interest to match the other country's subsidies.

What is unequivocally true, however, is that the joint welfare of the exporting countries is diminished by the subsidies. If they could find a way to abstain from extending subsidies, each could increase its welfare. Typically, contracts to this effect are as difficult to enforce as market share agreements in cartels. To date little research has been done into how international agreements to cut export subsidies should be structured to give the countries that are party to it the maximum incentive to abide by the rules.

#### **Market Power on the Buyer Side**

In the past, Soviet government officials who negotiated import contracts demonstrated their ability to use their market power and to play the different exporters and their governments against each other. Stories abound about the savvy conduct of Soviet negotiators awarding the contracts for the Yamal pipeline. In a recent *Wall Street Journal* editorial, Gordon Crovitz states:

The Soviet Union was a monopsonist, the sole "buyer" of pipe and equipment from Europe. . . . All information was held by the Soviets, who—at least in theory—should have been able to hold out for the best deal from each of the European countries. This is precisely what they did. . . . Western exporters of equipment were forced to cut their prices by as much as 60% because of their weak position as independent bargainers against the U.S.S.R.<sup>4</sup>

Such anecdotal evidence, while consistent with monopsonist behavior, does not constitute proof. The Soviet Union purchase of identical goods in different markets at distinct prices would constitute unambiguous evidence of monopsony power. The only reason a buyer would

<sup>4</sup>Crovitz, 1983.

purchase anything at the higher price is to avoid bidding up the lower price in the other markets, thus increasing total costs. Given the political sensitivities and the secrecy surrounding such international transactions as the pipeline deal, that evidence may be difficult to obtain.

Salant (1984) has shown that if exporters face a monopsonist importer, a tax, and not a subsidy, is the optimal policy. By applying a sliding export tax scale, exporting countries can completely offset the importer's monopsony power. But the effectiveness of such a system would require international cooperation among the exporting nations.

Such cooperation can be achieved only if each country is made to understand that the benefits of cooperating would exceed the benefits of circumventing the agreement. Unfortunately, the export lobbies in many Western countries are quite powerful. Western governments tend to hear the complaints from the few who are hurt severely by a policy change much more clearly than the often weak and ineffective protestations of taxpayers and consumers who have to foot the bill. In addition, popular belief among politicians is still firmly rooted in the neo-Keynesian idea of export-led expansion and growth. The fallacy that exports are good because they create jobs is rarely recognized for what it is: a one-sided view of the benefits of a policy without any regard to its costs.

## **IV. THE EFFECTS OF EXPORT SUBSIDIES ON EAST BLOC IMPORTS AND PRODUCTION**

### **EAST BLOC IMPORTS**

In 1981 the Soviet Union and its East European allies imported about \$59 billion of goods and services from the developing and the developed market economies. Of this sum about \$45 billion came from the OECD area, and more than one fourth (\$12.4 billion) was paid for with officially supported Western credits. In this section we analyze the effectiveness of the subsidies in increasing exports or, alternatively, the amount by which the exports would have been reduced if the subsidies had not been available.

Direct and indirect export credit subsidies have the effect of reducing the debt service payments that a country will have to assume in order to be able to borrow. Alternatively, they increase the amount a country can borrow, given its ability to service its external debt. If, for example, Bulgaria could make debt service payments amounting to \$100 million each year, it could service a debt of \$400 million at an interest rate of 10 percent.<sup>1</sup> But if Bulgaria had to pay 12 percent interest instead, it could service only \$385 million. The \$15 million difference amounts to the discounted difference in financing costs at 10 and 12 percent interest.

Direct and indirect export credit subsidies reduce the financing costs. The subsidies that we have calculated are the discounted difference in financing costs between supported and unsupported loans. They thus represent the increase in imports made possible by the subsidies. If the borrowers have borrowed up to their credit limit, removing the subsidies will force them to decrease their imports by an equal amount.

There are several ways in which this one-to-one correspondence between subsidies and East Bloc imports can be modified. A country may choose to reduce its imports by less than the full subsidy amount in the year when the subsidies are granted and assume higher debt service payments. But to be able to make these higher debt service payments, the borrowing country may be forced to reduce imports in the

<sup>1</sup>Assuming a five year loan with equal principal repayments, and interest payments amounting to 10 percent of the average balance (half of the original loan amount).

future. If the overall resources that can be spent on imports and debt service remain the same, the discounted reduction in future imports will be equal to the difference between the subsidy and the reduction in borrowing (and thus imports) in the first year. Only countries that can afford to expand their debt service obligations, because they face good prospects for increased hard currency earnings in the future, may be able to reduce their imports by less than the subsidies without being forced to reduce their future imports as well. The Soviet Union may well be in this situation. For these countries, estimates based on constant debt service burdens are an upper bound for the likely reduction in imports due to a removal of the subsidies, a "worst case" scenario from a Western exporter's point of view.

The higher financing costs may induce a borrower to reduce his borrowing by more than the amount necessary to keep his debt service payments at the same level. Because the removal of export credit subsidies increases the costs of imports, a country may decide to reduce exports and use the freed resources to become more autarkic. With this sort of a price response, imports may be reduced by more than the value of the subsidies.

Crane and Kohler (1984) have analyzed imports by the Soviet Union and its East European allies and have found very little price response. Even for individual categories of goods there is no evidence that lower import prices lead to increases in imports over and above the increase possible due to the reduced need for hard currency. In other words, the total expenditure on imports does not increase when prices are reduced. The net effect of the price reduction is that for the same total amount of hard currency, the importing countries receive more goods than before. One reason is that most East European countries are severely constrained in their ability to obtain hard currency. Their opportunities for expanding their export earnings are small. They export primary products and low tech industrial inputs such as steel, cement, nails, etc. The markets for these products in the West are limited, and the competition from the third world is great. In addition, anti-dumping laws in the West make it difficult for the East European exporters to compete on a price basis.

The only other source of hard currency is international borrowing. Most East European countries have reached their limits in this area as well. Only Bulgaria and Hungary, thanks to their small external indebtedness, and the Soviet Union, thanks to its considerable gold reserves, are in a position to increase their debt service payments.

Crane and Kohler (1984) adapted a model from the economic literature on consumer behavior for analyzing the import decisions by East European governments. Like a consumer, East European government-

have a predetermined amount of income (hard currency) available for servicing their debt and for purchasing imports. This hard currency is the sum of what they are able to earn by selling their exports abroad plus the loans they are able to raise in international financial markets. The amount they can spend on imports is equal to the total available hard currency less debt service payments. Western subsidies, which reduce debt service payments, relieve this constraint and allow an increase in imports corresponding to the value of the subsidy.

The linear expenditure system, adopted by Crane and Kohler, describes how this added disposable "income" is allocated among different categories of imports. Table 11 reproduces the estimated elasticities of hard currency imports by category with respect to hard currency available. For example, the estimated elasticities for the Soviet Union imply that a 1 percent increase in available hard currency—e.g., due to a corresponding reduction in debt service payments—might lead to a 1.2 percent increase in food imports, a .92 percent increase in primary products and chemical imports, a .87 percent increase in machinery imports, and a .96 percent increase in imports of intermediate and consumer goods.<sup>2</sup>

Remarkable in this list are the low elasticities for manufactured goods. If export subsidies are intended as a means of maintaining jobs in manufacturing industries, they do not do so very effectively. The additional hard currency made available to the Eastern bloc is used

Table 11

ELASTICITIES OF SOVIET BLOC IMPORTS FROM  
THE WEST BY COMMODITY WITH RESPECT TO  
AVAILABLE HARD CURRENCY  
(Conditional standard errors in parentheses)

Commodity and SITC No.	Elasticities	
	Soviet Union	Eastern Europe
Food (0-1)	1.20 (.053)	1.15 (.096)
Raw materials (2,3,5)	.92 (.183)	1.07 (.132)
Machinery (7)	.87 (.129)	.91 (.127)
Intermediate and consumer goods (6,8)	.96 (.096)	.92 (.096)

SOURCE: Crane and Kohler (1984).

<sup>2</sup>These elasticity estimates, based on historical observations, are the best "predictors" available. It is of course possible that a major reorientation in planning priorities might cause future patterns to diverge substantially from those of the past.



primarily for the purchase of primary products and less than proportionally for the purchase of manufactured goods.

Crane and Kohler use these elasticity estimates to calculate the probable reductions in imports from the West that the Soviet Union and Eastern Europe would have had to accept if the subsidies paid in 1981 had not been granted. In other words, if in 1981 the OECD governments had not supported credits to the Soviet Union and Eastern Europe, by how much would Western exports to these areas have been reduced? The results of their calculations are given in Table 12.

Table 12 is based on the assumption that the importing countries would keep their debt service payments constant. It is unlikely that many governments would try to reduce their debt service payments in response to a removal of the subsidies. Crane and Kohler tested for such price effects and found none. Those countries that are in a position to do so would probably choose to increase their debt service payments by reducing their borrowings by less than the subsidies. In that case, the reductions listed in Table 12 are an upper bound.

Given this model, the overall reduction in Western exports to the East is equal to the size of the export subsidies. Large price responsiveness, which might have led to an increase in imports over and above the subsidy value, could not be found. Thus the export credit

Table 12  
REDUCTION IN EAST BLOC IMPORTS IF 1981 SUBSIDIES  
HAD BEEN WITHDRAWN  
(In \$ millions, percent of 1981 imports in parentheses)

Origin	Total Reduction in Imports	Food	Raw Materials	Machinery	Intermediate and Consumer Goods
Europe	1576 (4.7)	268 (5.3)	416 (5.7)	433 (4.5)	459 (4.1)
Canada	68 (3.6)	62 (3.6)	3 (3.4)	2 (5.9)	1 (4.2)
U.S.	221 (5.2)	165 (5.5)	35 (5.1)	15 (3.4)	6 (5.0)
Japan	117 (2.9)	0	20 (3.9)	46 (3.3)	51 (2.5)
Australia (incl. N.Z.)	41 (3.5)	17 (2.8)	23 (4.4)	0	1 (6.7)
Other OECD	6	1	3	0	2
Total OECD	2028 (4.5)	513 (4.9)	500 (5.4)	496 (4.3)	519 (3.9)
Non-OECD	648 (4.6)	294 (3.8)	304 (5.8)	2 (4.3)	48 (4.1)
Total	2676 (4.5)	807 (4.4)	804 (5.6)	498 (4.3)	567 (3.9)

SOURCE: Crane and Kohler (1984).

subsidies granted in 1981 have not added much to trade flows; and in their absence, trade would not have been much smaller. In particular, the charge often raised by the Europeans that removing the subsidies would impose higher "costs" on them than on the United States seems overblown. U.S. trade with the Soviet Bloc would be reduced more than European exports. The European complaint is justified only inasmuch as Soviet Bloc trade is a smaller proportion of U.S. exports than it is of European exports.

### **EFFECT OF SUBSIDIES ON SOVIET PRODUCTION POSSIBILITIES**

At any one time, the Soviet Union, like every other economy, is constrained in what output can be produced. If the Soviets should decide to increase output for military purposes, they will have to reduce the growth of their consumption, and vice versa. Hopkins and Kennedy (1984) have estimated the rate at which the Soviet Union can substitute one type of output for another.

The results of these estimates are transformation curves that plot possible growth rates of military output against possible growth rates of output for consumption purposes. For example, for the decade 1980 to 1990, Hopkins and Kennedy estimate that the Soviet Union might be able to sustain a growth in military production of approximately 4.5 percent per year (consistent with the experience of the early 1970s), combined with a growth rate in output for consumption purposes of around 2.73 percent. If the Soviet Union should decide to increase the growth rate of military output, it would have to do so at the expense of the growth rate in civilian consumption output, and vice versa.

Credit subsidies transfer resources that enable the Soviet Union to increase the growth rate of one type of output without necessarily having to accept a reduction in the other type of output. Technically speaking, the subsidies, like any resource increase, shift the transformation curve outward. Here we analyze the extent to which this outward shift occurs, based on the estimates of subsidies made above.

We investigate Soviet growth projects for the 1980s under two different sets of assumptions. In both cases we assume that the Soviet Union will continue expanding its international net borrowing at an annual rate of 9 percent. In the base case we assume that the same constant fraction of loans from the West continues to be subsidized directly and indirectly by Western governments.<sup>3</sup> In the "no more

<sup>3</sup>The direct subsidy, however, declines very rapidly because of the general increase in consensus rates and the lowering of risk free interest rates in the West, both of which we expect to continue until 1990.

subsidies" case, we assume that after 1981 new loans to the Soviet Union will be extended at commercial rates that reflect the surcharge lenders would demand according to their perception of default risks. In that case, the subsidized portion of loans declines in accordance with the current term structure of loans officially supported by the West. By 1990 the officially supported portion of the loans is practically nil (see Table 13).

The Hopkins-Kennedy model calculates the possible combinations of military and civilian sector growth rates that the Soviet Union can attain in both cases. The results are listed in Table 14, for three different values of perceived risk  $P$ . If the Soviet Union's creditworthiness remains about the same as it was in 1981 (2.3 percent), then the case for  $P = .025$  is probably the most realistic. The other two cases, for assumed  $P$ s of .05 and .075, are listed only to provide an impression of how critically these estimates depend on the perceived risk assumptions.

Compared with the size of the Soviet economy, the beneficial effects of the subsidies are quite small, even if we consider the cumulative effects over the entire decade. Compared with Soviet military expenditures, however, they are somewhat bigger. In Table 15 we have compared them with some other scenarios that have been evaluated by Hopkins and Kennedy (1984). For example, removing the subsidies has a much smaller effect than a decrease in the rate of technical progress ("Low Technology"). Nevertheless, we must not underestimate their importance.

If similar calculations were made for the East European and other communist economies, the effects would probably be more substantial, because the subsidies they receive relative to the size of their economies are larger than for the Soviet Union. Their foreign trade sector is relatively more important, and their credit rating is considerably worse, giving rise to a larger indirect subsidy per dollar borrowed. Economies with large financing and refinancing needs, such as Poland and Romania, may even show dramatic effects. Overall, however, we doubt that the potential harm inflicted on the economies of the Soviet Union and its allies by a removal of the subsidies would be very large.

This is of course no excuse for continuing the subsidies. We have no reason for wanting to enable the Communist Bloc to expand their military expenditure, and even small resource transfers ought to be considered with suspicion. After all, \$3 billion just about buys an aircraft carrier. Under the current policy, we transfer the equivalent of an aircraft carrier in resources to the Communist world each year. If such transfers do not have substantial offsetting benefits to us, as seems to be the case here, they should be discontinued, regardless of their effect on the Soviet Union.

Table 13  
BENEFIT TO USSR OF CONTINUED SUBSIDIZATION OF OECD CREDITS

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1990
Officially supported debt										
Continuous current policy	18658.0	20552.2	22405.2	24421.7	26612.6	29015.4	31626.8	34473.2	37575.8	40967.6
Discontinues supporting new loans after 1961	18658.0	15660.0	12626.9	9966.0	7444.3	5186.4	3337.6	2036.7	17.0	0.0
Difference in subsidies										
Assuming $P = .025$	0.00	86.6	204.12	315.49	406.22	514.19	621.29	721.82	829.67	928.06
Assuming $P = .05$	0.00	156.61	404.86	645.72	862.78	1095.91	1323.78	1537.58	1766.89	1975.95
Assuming $P = .075$	0.00	226.64	618.15	966.52	1347.80	1713.88	2070.07	2404.21	2762.58	3069.25

NOTES:

Assumptions:

Continued growth of hard currency borrowing at 9 percent per year.

Constant share of officially supported loans in total borrowing.

Risk free interest rates: 1961-1963 actual yields of government bonds in leading countries.

1964-1990 declining at 5 percent per year from 1963 levels.

OECD consensus rates: 1961-1963 actual rates set in OECD gentlemen's agreement.

1964-1965 average of 1963 rate and risk free rates.

1966-1990 risk free rates.

The benefit to the USSR is defined as the annual savings in financing costs due to official lending at consensus rates. It grows over time as officially supported lending grows and as old loans get refinanced at subsidized rates.

Table 14

**REDUCTIONS IN SOVIET GROWTH RATES DUE TO REMOVAL  
OF SUBSIDIES  
(Percent)**

		Perceived Probability of Default		
		.025	.05	.075
Reduction in consumption rate of growth (assume defense = 4.5%)	per year	.056	.119	.186
	cumulative (10 yrs.)	.50	1.2	1.8
Reduction in defense rate of growth (assume consumption = 2.73%)	per year	.22	.46	.72
	cumulative (10 yrs.)	2.1	4.5	7.2

Table 15

**REDUCTION IN THE ANNUAL GROWTH RATE OF  
CONSUMPTION FOR DIFFERENT SCENARIOS  
(Percentage points per year, assuming defense  
growth = 4.5 percent per year)**

Scenario	Reduction in Growth Rate
No more credit subsidies ( $P = 2.5\%$ )	.056
Increased foreign aid	.067
Low gold price	.107
No more credit subsidies ( $P = 5.0\%$ )	.119
No more credit subsidies ( $P = 7.5\%$ )	.186
High grain price	.297
Low oil output	.387
Poor weather	.397
Low technology	2.542

## V. CONCLUSIONS

We have estimated the size of the subsidies granted by Western governments on credits to the East, and we have found it to be substantial. The indirect subsidies that arise from the assumption of non-payment risks by the Western governments are particularly large, amounting to almost \$2 billion in 1981. Overall the credit subsidies are probably in excess of \$3 billion, over 20 percent of officially supported credits.

But when examined in light of the size of the Soviet economy or the total volume of Western exports to the East, the figures do not seem quite so large. The Western credit subsidies have enabled Eastern Europe, including the Soviet Union, to increase its imports from the West by about 5 percent. If the subsidies are continued through the eighties, they will enable the Soviet Union to marginally increase its growth rate of civilian output without having to reduce military output, or vice versa. We have to conclude, however, that discontinuing the subsidies is unlikely to impose severe hardships on the Soviet Union and its allies.

But the realization that the threat of a subsidy withdrawal is not a very sharp instrument of economic warfare should not lead us to conclude that we should continue subsidization. Any addition to Soviet hard currency resources should concern us, and before we continue a policy that has this effect we should weigh its advantages and drawbacks carefully.

Western policymakers never intended to transfer resources to the East. This transfer has been a side effect of the export credit policies that were pursued in the belief that they increase Western domestic welfare. We therefore carefully examined whether export credit subsidies did indeed increase domestic welfare, and whether such an increase could be sufficient to offset the negative side effects of the resource transfer.

Our conclusion is that export credit subsidies are more likely to reduce than to increase domestic welfare. This result should not come as a surprise to any economist accustomed to analyzing the effects of subsidies and taxes in the traditional neoclassical framework. However, even if we depart from the standard competitiveness assumptions and allow for externalities, the conclusion still holds. The circumstances in which export credit subsidies are likely to improve the

welfare of the exporting country do not correspond to the institutional realities of East-West trade.

In fact, when dealing with a monopsonist importer, Salant (1984) finds that an export tax and not an export subsidy is the optimal policy. The only set of circumstances in which a country might find it advantageous to subsidize some of its exports, in conjunction with other export taxes, is characterized by foreign policy considerations. We outline the argument briefly in Appendix B. However, such a system has definite economic costs, which would have to be outweighed by the foreign policy advantages. The current system of widespread export subsidies across the board certainly cannot be justified on foreign policy grounds.

We find ourselves in the position of having a policy that is almost certainly harmful to our economic growth and welfare and transfers resources to our strategic adversaries. Some export industries do in fact profit from the current system. However, the employment gains and profits go at the expense of domestic consumers in these industries, and profits and employment in other industries. On balance the domestic economy loses out, and foreign importers are the only net gainers.

We should rethink our export credit policies. In cooperation with our allies we must strive for a more rational approach to export credits and credit guarantees, especially as they pertain to East-West trade. The design of new trade policies that take the special economic and political circumstances of East-West trade into account should be the next logical step, followed by negotiations aimed at developing new international agreements that do not embody strong incentives for circumvention by individual participants.

## Appendix A

### RISK AVERSION

Risk averse lenders discount the expected return from risky investments by considering the variance in the expected rate of return. It is thus possible that risk averse lenders prefer an investment with a low expected rate of return and a small variance to one with a high expected return and a large variance. It is often thought that risk aversion plays an important role in situations where the investment is very large compared with the investor's total net worth. In these circumstances, where a negative outcome has the possibility of wiping an investor out, he may prefer to invest conservatively, at a low rate of return, rather than risk losing (or gaining) everything.

It is difficult to imagine such large corporations as Chase-Manhattan Bank, Citibank, and others being risk averse in the strict sense. Even large international loans are small compared with the total assets of most institutions active in international lending. Furthermore, these banks can spread the risks through syndications, and they can often balance their portfolios by purchasing a variety of risks.

Nevertheless, it is possible that in certain circumstances even large international lenders act in a risk averse manner. Some loan contracts may be so large that risk aversion begins to be important, or individual decisionmakers in large banks may be risk averse and their personal risk aversion is reflected in the bank's actions. However, it is unlikely that risk aversion on the part of lenders would change our estimates and conclusions in any important way.

Recall that throughout we have defined  $P$  as the *perceived* probability of default, and that we have calculated the risk surcharge as a function of this variable. If the  $P$ s that we actually use in our calculations reflect true perceptions, not influenced by any considerations of risk aversion, we would have to allow for an additional risk premium to compensate lenders for their risk aversion. In that case our estimates represent a lower bound.

It is more likely, however, that the surcharges we calculate already include any risk aversion premiums that might be appropriate. We calculated the implicit perceived risks from actual market data, for example from the forfaiting discounts applied by Finanz AG. If Finanz AG was risk averse, the forfaiting rates they list would also include a



premium to compensate them for risk aversion. The implicit default probabilities we calculate from these data would be biased upward, and the surcharges we calculate on the basis of these biased  $P$ s would reflect not only the risk surcharge as defined in the text, but also a risk aversion premium. In other words, if risk aversion was considered to be a serious concern, we would have to allow for it in two places: in the calculation of the perceived  $P$ s and in the calculation of the risk surcharge and premium. The result would probably be exactly the same magnitude for the indirect subsidy estimates; however, there would be two components to them: a subsidy due to the removal of the risk surcharge and one due to the removal of the risk premium.

The distinction between risk surcharge and risk premium might be important if the argument is made that government should be less risk averse than private investors. In those circumstances, it might be justifiable for governments to demand smaller spreads on risky loans than private investors would charge. Some authors, among them Arrow and Lind (1970) and Samuelson (1964), have argued that the government is better able to spread risk and could thus be justified in using a smaller risk premium than private investors. Others, for example Hirschleifer (1966) and Diamond (1967), disagree, arguing that in a world of stock and bond markets, private individuals and firms can spread risk equally well by diversifying their portfolios. Stapleton and Subrahmanian (1978) have even argued that, because government spreads the risks of its investments along arbitrary lines through the tax system, it cannot equate the marginal riskiness of its projects with the marginal risk preferences of its "stockholders" (taxpayers), making its risk distribution less efficient than it would otherwise be. Consequently, government should use a higher risk premium than the free market would indicate.

Sandmo (1974) and Holstrom (1980) have resolved this dispute by noting the importance of market structure. If a government operates in markets where private firms are also present, and if the shares of the private firms are traded efficiently, there is little justification for government to use a risk premium different from that of the private firms. However, in imperfect markets, for example public goods, a different risk premium for government investments may be justified.

For "investments" in export credit guarantees there is little justification for using a risk premium different from that of the private market. Private market equivalents do exist, private insurers do offer insurance policies similar to the ones offered by the official export guarantee agencies, and there are no obvious public goods aspects to the output produced.

## **Appendix B**

### **EXPORT SUBSIDIES AS INSTRUMENTS OF FOREIGN POLICY**

Throughout this report we have considered only the economic benefits to the West of subsidizing exports. However, export subsidies, in conjunction with export taxes, could be used to further foreign policy goals as well. We give a hypothetical illustration drawn from Salant (1984).

The Soviet Union covers its oil needs primarily from domestic sources. But the oil fields are beginning to run dry, and future energy needs can be met in only two ways. The Soviets must either improve the efficiency of their drilling and pumping operations with the aid of imported technology, or they must secure foreign sources of petroleum through subversion or overt military pressure. In deciding which course to pursue they will evaluate the costs and benefits of either option and choose the less expensive one.

A tax or an embargo on Western drilling equipment would make the option of "acquiring" oil from abroad relatively less expensive for the Soviets. It might have the unintended cost for the West of having to face and counter an increased Soviet threat in oil producing regions of the world, such as the Persian Gulf or South East Asia. Alternatively, subsidizing Western drilling equipment would make the domestic option less costly for the Soviets. However, as we have shown in this report, it has the unintended side effect of transferring resources to our strategic adversaries, thus enabling them to increase their civilian or military expenditure.

The solution to this dilemma might be a combination of an export tax and subsidy. We would like to be able to alter the relative costs of the different options to the Soviets without transferring resources. We can accomplish that by a product-specific export subsidy on drilling equipment combined with a general tax or access fee for the Soviets to enter Western markets. The specific subsidy has both a price effect (it alters the relative costs to the Soviet Union) and an income effect (it transfers some resources). However, the income effect is offset by the access fee. As a consequence, the Soviet Union is as well off as before, but it faces a new set of prices that make the option of "acquiring" oil from abroad through covert or overt military pressure less attractive.

This hypothetical example is intended as an illustration only. It points out that export subsidies, like all instruments of trade policy, have foreign policy consequences that ought to be considered. Especially when we are dealing with a strategic adversary, more than economic expediency should guide our decisions. Although we may not understand Soviet intentions and preferences well enough to use trade subsidies and taxes effectively in the manner described above, we may nevertheless want to take into account the different price and income effects of export subsidies and taxes before we apply them to East-West trade.

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siveness, which might have led to an increase in imports over and above the subsidy value, could not be found. Thus the export credit

Table 12

**REDUCTION IN EAST BLOC IMPORTS IF 1961 SUBSIDIES  
HAD BEEN WITHDRAWN**

(In \$ millions, percent of 1961 imports in parentheses)

Origin	Total Reduction in Imports	Food	Raw Materials	Machinery	Intermediate and Consumer Goods
Europe	1576 (4.7)	268 (5.3)	416 (5.7)	433 (4.5)	459 (4.1)
Canada	68 (3.6)	62 (3.6)	3 (3.4)	2 (5.9)	1 (4.2)
U.S.	221 (5.2)	165 (5.5)	35 (5.1)	15 (3.4)	6 (5.0)
Japan	117 (2.9)	0	20 (3.9)	46 (3.3)	51 (2.5)
Australia (incl. N.Z.)	41 (3.5)	17 (2.8)	23 (4.4)	0	1 (6.7)
Other: OECD	6	1	3	0	2
Total OECD	2028 (4.5)	513 (4.9)	500 (5.4)	496 (4.3)	519 (3.9)
Non-OECD	648 (4.6)	294 (3.8)	304 (5.8)	2 (4.3)	48 (4.1)
Total	2676 (4.5)	807 (4.4)	804 (5.6)	498 (4.3)	567 (3.9)

SOURCE: Crane and Kohler (1984).

END  
DATE